

# Principles of health economics

## Introducing the principles of pharmacoeconomics and pharmaceutical innovation

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# Fundamentals of Economics

- The term “economics” refers to the range of activities aimed at acquiring goods and services, and the relationships which regulate the production of and trade in these goods and services
- The theory of modern economy is based on several core assumptions:
  - Existing resources are naturally limited
  - Human demand is unlimited and grows continuously
  - Efficiency is defined as a state in which the minimal use of resources provides maximal benefits and goods

*Modern economics aims to secure the efficient allocation of scarce resources to satisfy unlimited demand*

# What is Health Economics? (1)

- Health economics focuses on the production and consumption of healthcare services and technologies and provides an economic outlook on healthcare systems and their stakeholders
- The demand for healthcare services requires a balancing between the stakeholders' preferences and financial constraints

Stakeholders	Financial constraints	Preferences
Patients	State/personal Insurance coverage, personal budget	Best treatment available, based on specific needs
Physicians	Coverage by payer, patient's financial resources	The most suitable treatment, Customized for each patient
Payers / Providers	State-level coverage, Budget available to the payer/provider	High level of treatment that can "get the job done"
Government / Regulatory agencies	Overall budget allocated to the acquisition of healthcare services	Satisfactory level of care across the board

# What is Health Economics? (2)

- The economic analysis of healthcare services accounts for multiple factors. The main three are:
  1. The cost of the service/technology
  2. The expected scope of use
  3. The overall benefit
- Indeed, a logical linkage exists between cost and benefit. While we are usually willing to pay a small extra in return for a higher benefit, we shall refuse to pay a large sum for a low benefit
- That is why the combination of the scope of use and the overall benefit provides us with the actual “value for money” of the service/technology

# Innovation in the view of health economics

- Innovation is an essential component in the field of healthcare; innovative treatments save lives, prolong lives, and improve the quality of lives of thousands of patients every day
- Pharmaceutical innovation is an exemplar of the continuous improvement of a technology whose scope of use is vast and whose contribution is multi-faceted
- For instance, reducing sickness days also reduces the burden on healthcare institutions and increases productivity, which in turn increases the country's economical competence
- However, pharmaceutical innovation involves a lengthy and expensive process in which failures outweigh success

# The broader context: Thinking about modern health systems and the pillars they stand on

**The Environment - rules and regulations**

**The Infrastructure- advanced, developing, etc.**

**The Institutions – regulatory, operations, treatment, etc.**

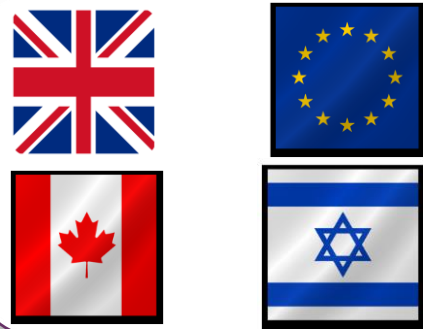
**The Financing – public, private, mixed**

The existence and sustainability of these structures will affect the manner in which the healthcare system operates at a **practical level**, including in the field of pharmaceuticals

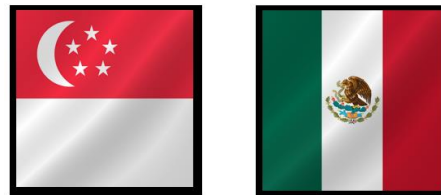
# Healthcare financing: Public, private and hybrid models

- A healthcare system can be financed by:
  1. **The public purse:** Public expenditure through direct healthcare or social security taxes, social insurance charges or general taxation
  2. **The private pocket:** Private expenditure through private health insurance, out-of-pocket (OOP) and co-payments
- Most healthcare systems are highly sophisticated, complex entities that operate from a mixture of public and private financing mechanisms

**Predominantly public**  
*Taxes/state budgets*



**Hybrid or fragmented**  
*Basic coverage + individual supplementary coverage*



**Predominantly private**  
*Out of pocket/private insurance*



# Allocation, prioritization, and dispensation: The three fundamentals of any health system including pharmaceutical pricing and reimbursement (P&R) policies

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## Allocation

The budget that payers are willing/unwilling to allocate to the financing of new medicines. Naturally the total amount of available financing will affect which medicines are financed in a given country.

## Prioritization

Medical/Therapeutic – the disease areas and medical conditions that a given country prioritizes across the board (be it communicable diseases such as HIV or epidemics or non-communicable diseases such as heart disease or obesity)

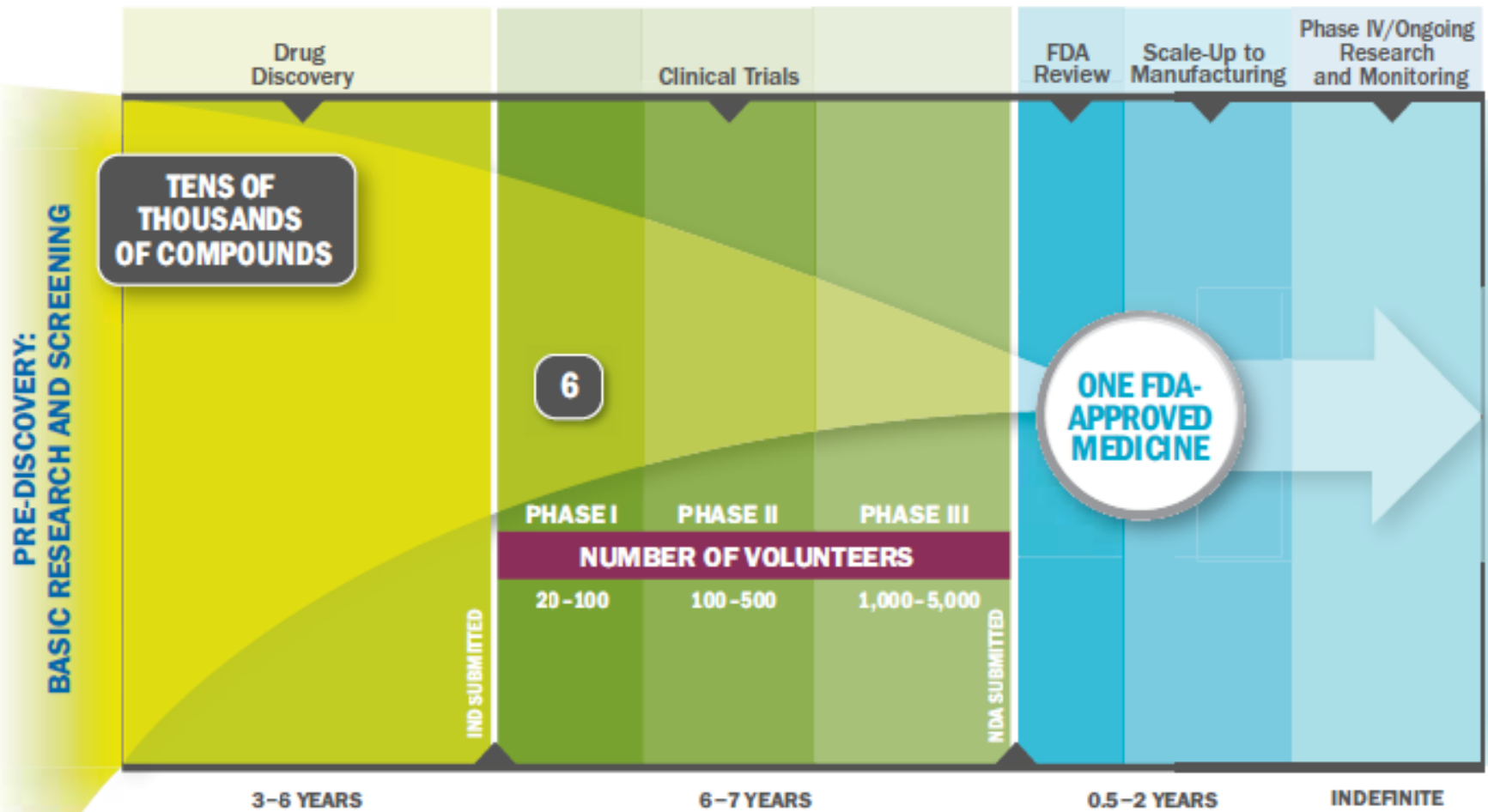
Economic – the process through which individual medicines or therapeutic classes are appraised and evaluated (for example, via a built-in appraisal process of cost vs. value)

## Dispensation

De facto elements that determine which medicines will be dispensed in practice by physicians (for example, a health fund mandating prescription of a certain medicine over its competitors)



# The pharmaceutical innovation process

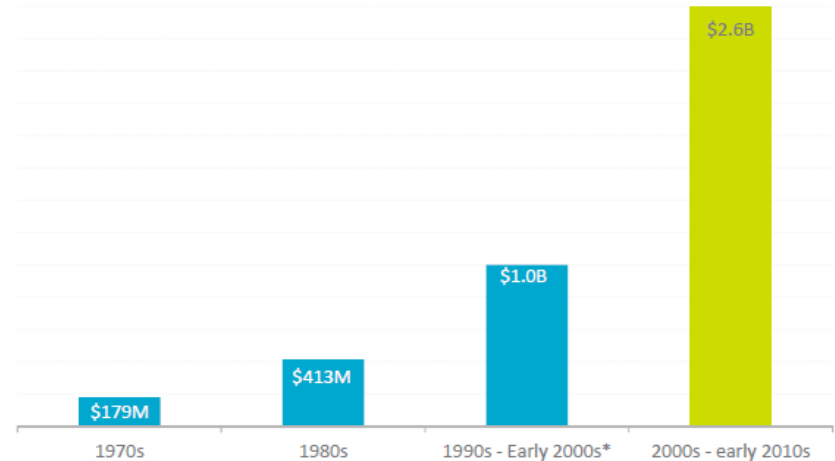


Source: PhRMA, (2021)

# Duration, cost, and risk

- Today, the average cost of developing an innovative medicine is estimated at \$3 Billion
- The average duration is 10-15 years
- Each successful innovative medicine comes at the price of ~5,000 failures; success rates during the clinical trials phase are only 16%
- Once approved for marketing, an innovative medicine's chances of success in recouping its investment are 1:3

*The Average Cost to Develop One New Approved Drug—Including the Cost of Failures  
(Constant 2013 Dollars)*



Source: PhRMA, 2021

# Pharmacoeconomics (1)

- While innovative medicines are essential to healthcare, the escalating costs and inherent risks of R&D as well as low chances of success within a limited time often result in high prices
- Concomitantly, the demand for innovative treatments also rises constantly, necessitating a wise and efficient resource allocation
- The field of pharmacoeconomics was introduced to assist this task, by providing tools for evaluating the scope of innovative medicine's benefits
- These tools aid decision-makers in answering the question: "which medicines should we pay for with our limited budget?"

## Pharmacoeconomics (2)

An innovative medicine-added value can be measured in three major levels:

1. Therapeutic value – measured in clinical outcomes in comparison to existing treatments
2. Economic value – measures the benefits of use (e.g. rise in productivity and reduced burden of the disease) and savings to healthcare systems (e.g. hospitalization days)
3. Societal value – measured in benefits to society's unmet needs, such as treatments for rare diseases

# Pharmacoeconomics (3)

Nevertheless, determining the added value of an innovative medicine depends on numerous factors as well as perspectives:

Stakeholder	Perception of value
Government	An equal distribution of healthcare services at a satisfactory level within budgetary limits
Payer/provider of services	The level of healthcare services should mirror the balance between maximum benefit to patients and savings for the payer/provider of services
Patient	The best treatment the patient is able and willing to pay for

Moreover, the extent of economic benefit is highly susceptible to the method of its calculation:

1. The calculator's identity – Governmental or private body, or even the patient herself
2. The included criteria – whether cost alone, or factors from additional aspects

# Factors that affect medicines prices

Medicines prices are affected by numerous factors in several aspects:

## The product's identity

- Is it an innovative or generic medicine?
- Is it a First-in-class medicine? A new medicine that competes with existing treatments? Or a new dosing or intake method?
- The manufacturer's required price

## The clinical condition

- Does the medicine saves lives?
- What is the severity of the clinical condition?
- Does the medicine prolongs or improves life? To what extent?
- What is the prevalence rate of the clinical condition?
- Does it constitute a public health risk?

## Pricing & reimbursement

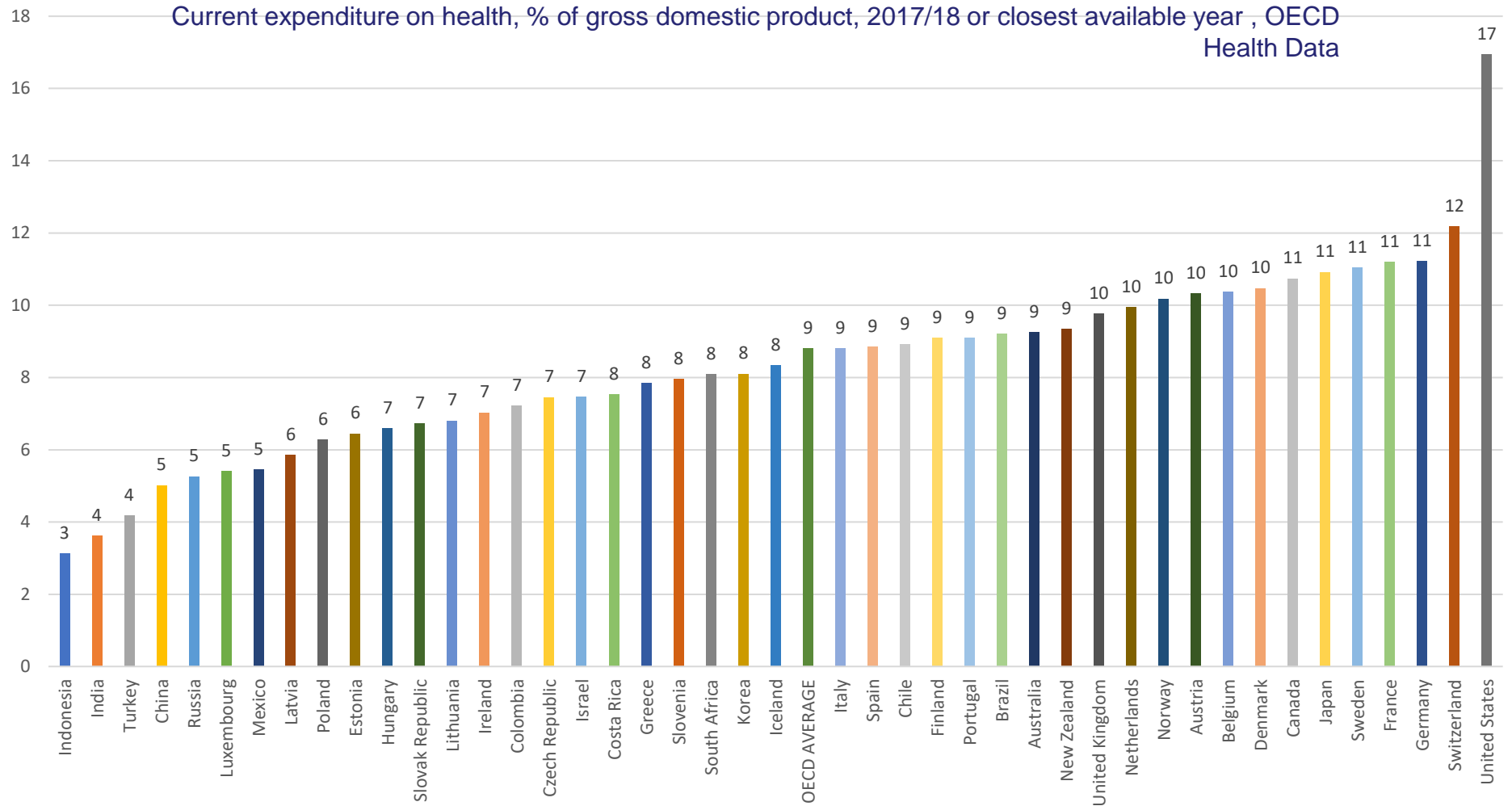
- Is the medicine eligible for reimbursement? To what extent?
- Will the medicine be accessible in private insurance schemes?
- What kind of pricing method is employed?
- Are prices being determined in direct negotiations between payers and manufacturers?

# Paying more for better?

- Prioritization and resource allocation in healthcare systems are performed with the recognition that it is impossible to provide the best treatments for all
- Thus, decision makers' prime motive is to achieve maximum value for money
- However, the cost-benefit relationship is not direct: expensive medicines can highly benefit only a few patients while cheaper medicine can provide lesser benefit to millions of patients
- Therefore, processes of prioritization constitute a continuous struggle between different and often conflicting needs, where there is no "right" or "just" distribution

# Different countries allocate different resources to healthcare

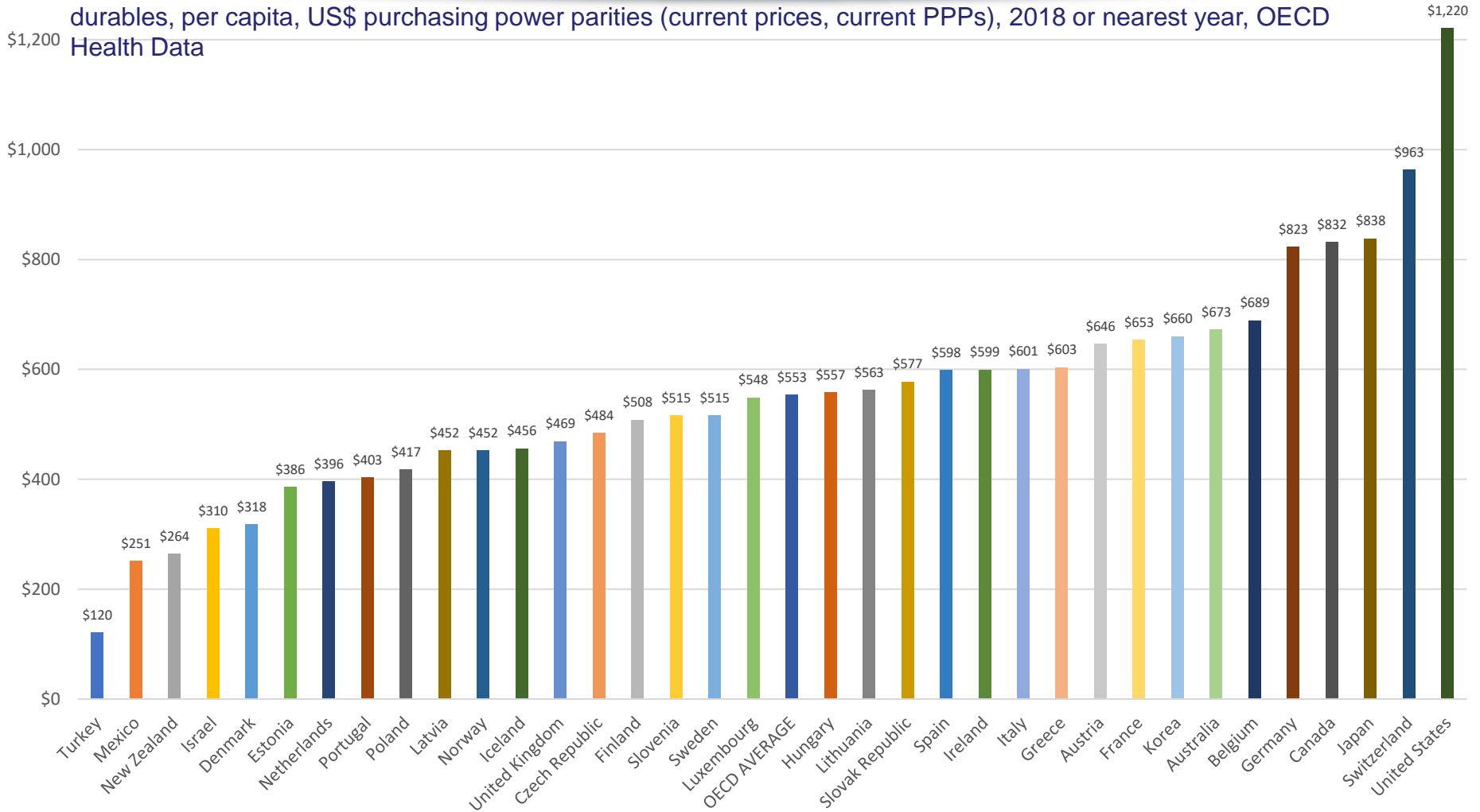
Current expenditure on health, % of gross domestic product, 2017/18 or closest available year , OECD Health Data





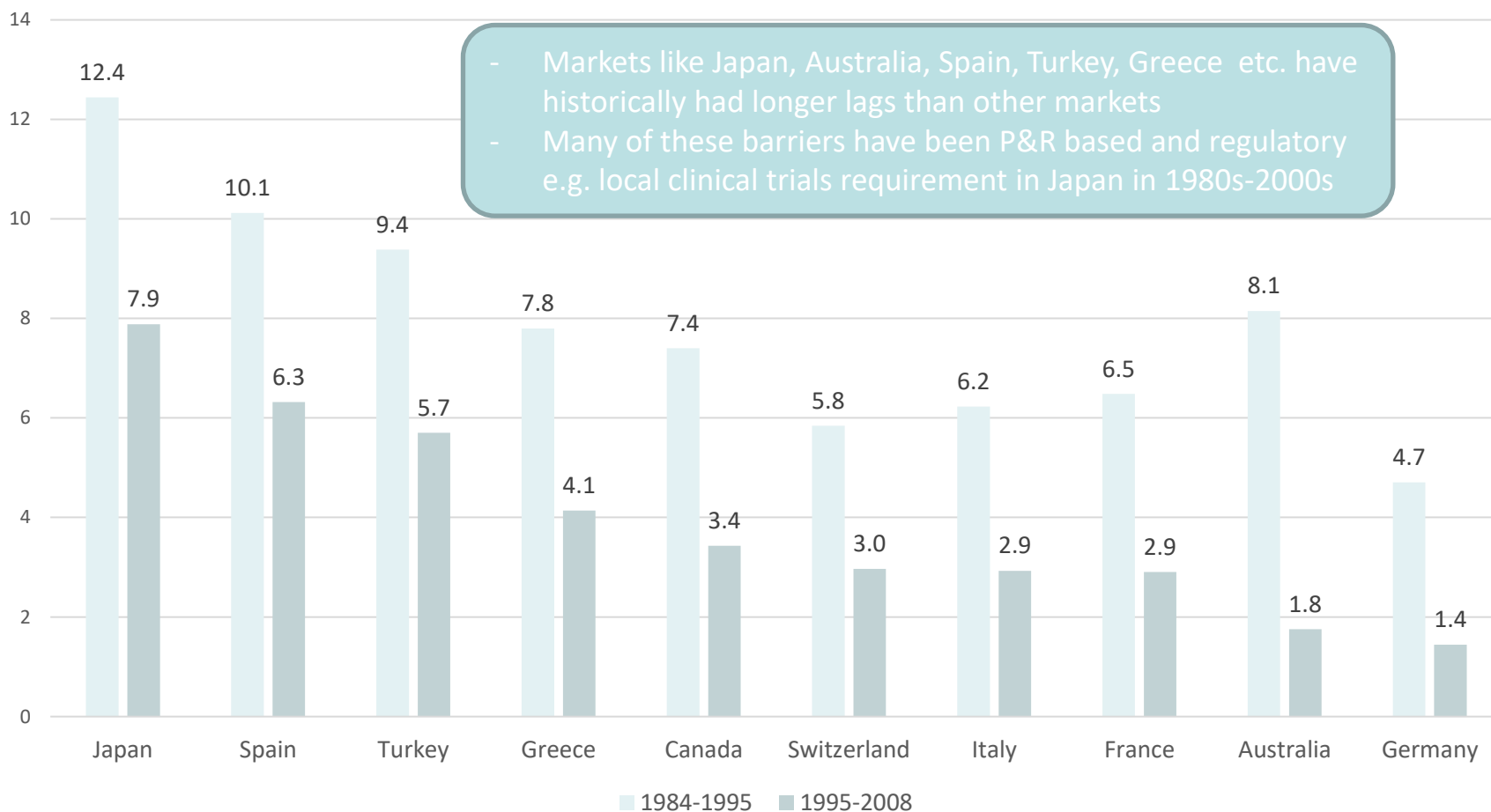
# Same thing for biopharmaceuticals

Current expenditure on pharmaceuticals (prescribed and over-the-counter medicines) and other medical non-durables, per capita, US\$ purchasing power parities (current prices, current PPPs), 2018 or nearest year, OECD Health Data

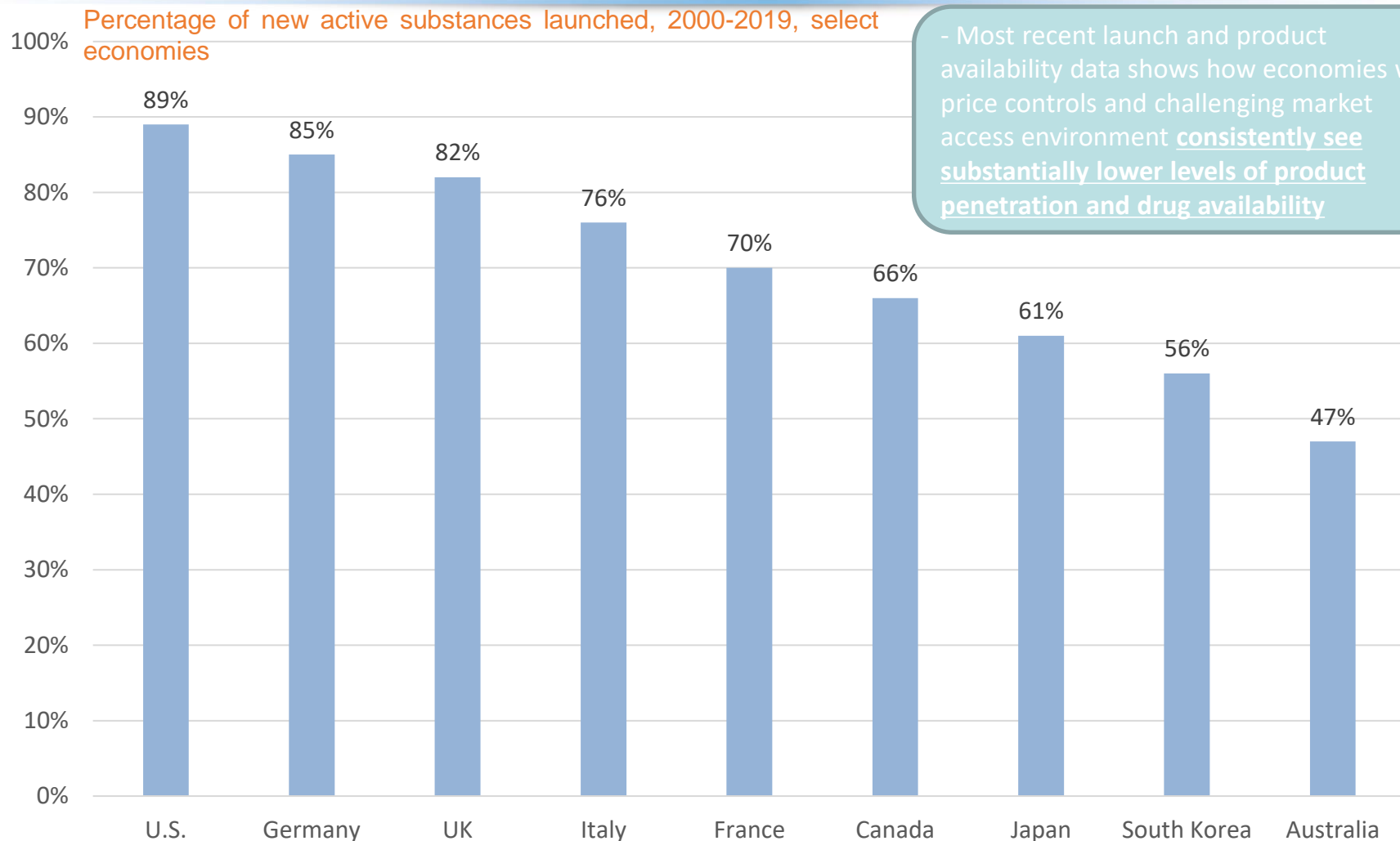


# Historically, economies that utilize strict P&R controls experience longer delays in access to innovative drugs

Mean Launch Lag (in years) for new active substances launched in the US & UK

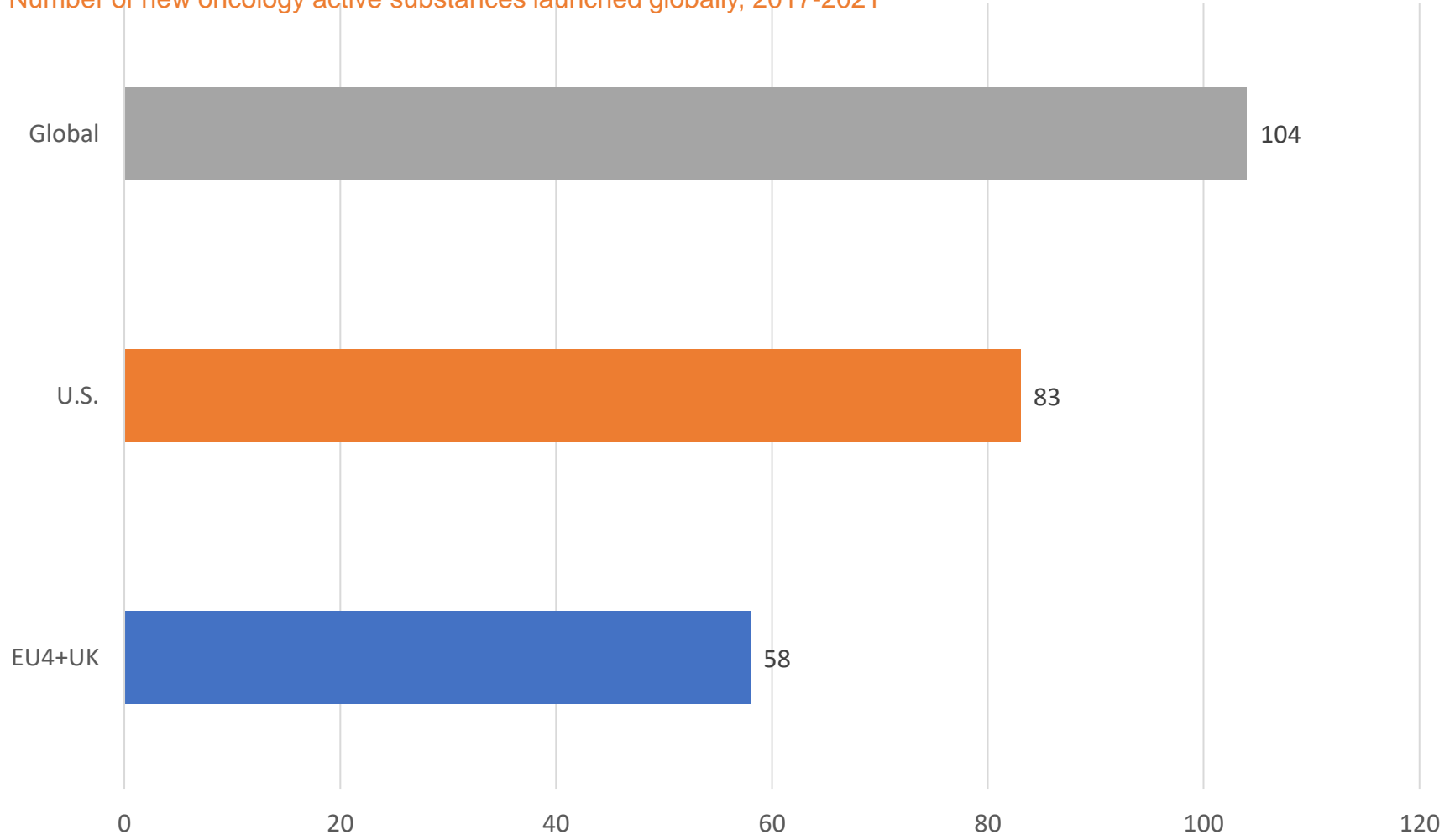


# Result is fewer products and less patient access

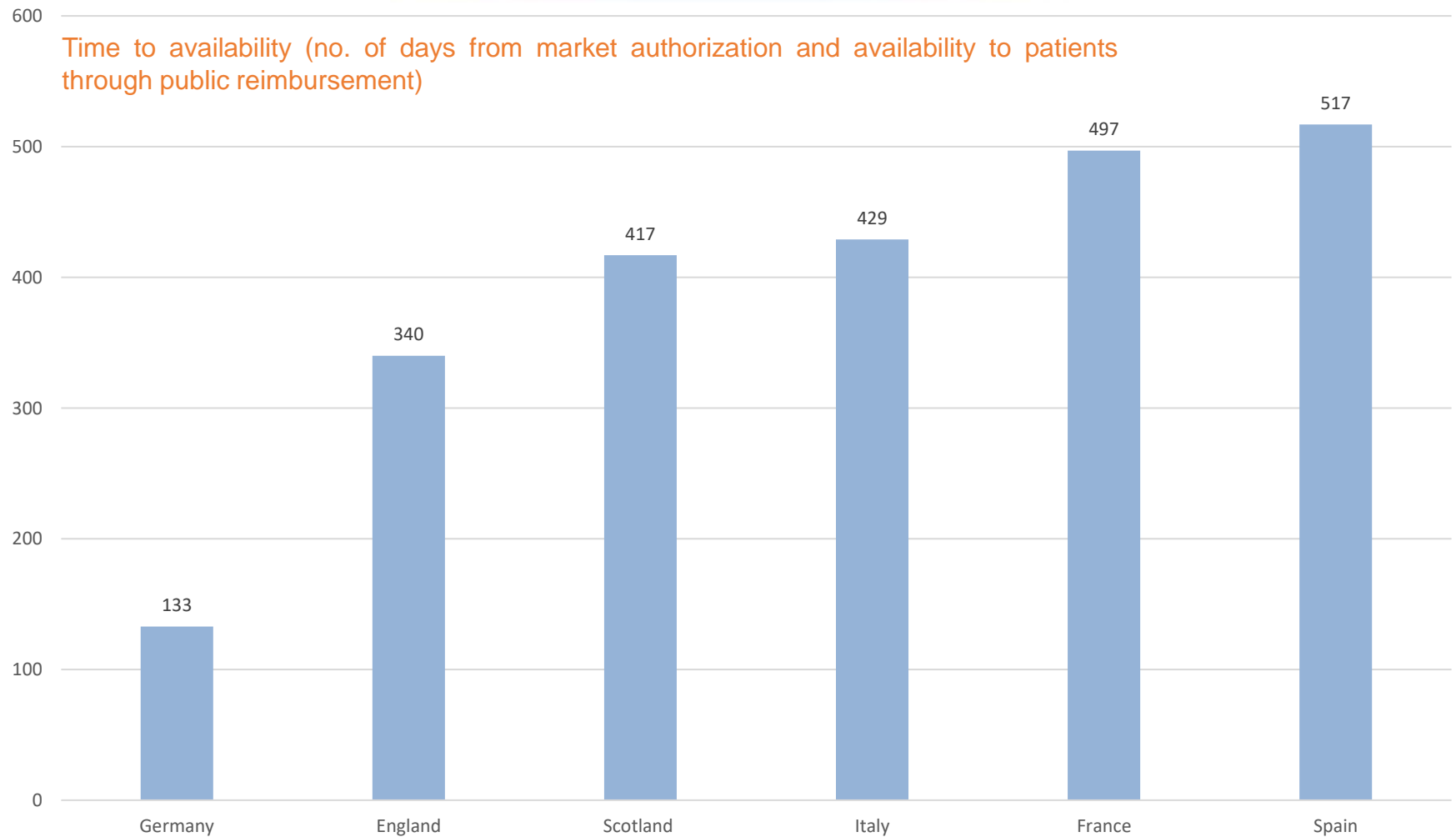


# Critically this disparity grows when looking at most recent data and advanced and innovative products

Number of new oncology active substances launched globally, 2017-2021



# The story in Europe – long reimbursement assessments = long access delays



## In conclusion:

- The gap between economics and health economics continues to widen – the major issue is efficiency vs. equality
- As economic pressures grow generally, and in health, in particular, we will see greater attempts by governments to “hedge their bets” and transmit the pressure downwards
- Pharmaceutical pricing and reimbursement will not differ from the overall trend. Greater price controls and budget squeezes will emerge, despite the value of new technologies.
- Patients groups will have a HUGE role in transmitting to governments which investment is worth it and which one is “nice to have”